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## NOTICE OF ALLOWANCE AND FEE(S) DUE

26371 7590 03/18/2004

FOLEY & LARDNER  
777 EAST WISCONSIN AVENUE  
SUITE 3800  
MILWAUKEE, WI 53202-5308

EXAMINER

WEST, JEFFREY R

ART UNIT

PAPER NUMBER

2857

DATE MAILED: 03/18/2004

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/910,371	07/20/2001	John E. Seem	510554.95814	2802

TITLE OF INVENTION: METHOD OF INTELLIGENT DATA ANALYSIS TO DETECT ABNORMAL USE OF UTILITIES IN BUILDINGS

APPLN. TYPE	SMALL ENTITY	ISSUE FEE	PUBLICATION FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1330	\$300	\$1630	06/18/2004

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHT. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THE STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE REFLECTS A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE APPLIED IN THIS APPLICATION. THE PTOL-85B (O AN EQUIVALENT) MUST BE RETURNED WITHIN THIS PERIOD EVEN IF NO FEE IS DUE OR THE APPLICATION WILL BE REGARDED AS ABANDONED.

### HOW TO REPLY TO THIS NOTICE:

#### I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status is changed, pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above and notify the United States Patent and Trademark Office of the change in status, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check the box below and enclose the PUBLICATION FEE and 1/2 the ISSUE FEE shown above.

Applicant claims SMALL ENTITY status.  
See 37 CFR 1.27.

II. PART B - FEE(S) TRANSMITTAL should be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). Even if the fee(s) have already been paid, Part B - Fee(s) Transmittal should be completed and returned. If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

**IMPORTANT REMINDER:** Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

**PART B - FEE(S) TRANSMITTAL**

Complete and send this form, together with applicable fee(s), to: Mail

**Mail Stop ISSUE FEE**  
**Commissioner for Patents**  
**P.O. Box 1450**  
**Alexandria, Virginia 22313-1450**  
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**INSTRUCTIONS:** This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 4 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Legibly mark-up with any corrections or use Block 1)

26371 7590 03/18/2004

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Note: A certificate of mailing can only be used for domestic mailings of Fee(s) Transmittal. This certificate cannot be used for any other accompany papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

**Certificate of Mailing or Transmission**  
I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO, on the date indicated below.

(Depositor's name)
(Signature)
(D)

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09/910,371	07/20/2001	John E. Seem	510554.95814	2802

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nonprovisional	NO	\$1330	\$300	\$1630	06/18/2004

EXAMINER	ART UNIT	CLASS-SUBCLASS
WEST, JEFFREY R	2857	702-179000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

2. For printing on the patent front page, list (1) the names of up to 3 registered patent attorneys or agents OR, alternatively, (2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

"Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. Use of a Customer Number is required.

1 \_\_\_\_\_  
2 \_\_\_\_\_  
3 \_\_\_\_\_

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. Inclusion of assignee data is only appropriate when an assignment has been previously submitted to the USPTO or is being submitted under separate cover. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent);  individual  corporation or other private group entity  government

4a. The following fee(s) are enclosed:

4b. Payment of Fee(s):

Issue Fee  
 Publication Fee  
 Advance Order - # of Copies \_\_\_\_\_

A check in the amount of the fee(s) is enclosed.  
 Payment by credit card. Form PTO-2038 is attached.  
 The Director is hereby authorized to charge the required fee(s), or credit any overpayment. Deposit Account Number \_\_\_\_\_ (enclose an extra copy of this form).

Director for Patents is requested to apply the Issue Fee and Publication Fee (if any) or to re-apply any previously paid issue fee to the application identified above.

(Authorized Signature)	(Date)
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NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, Alexandria, Virginia 22313-1450.

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SUITE 3800				
MILWAUKEE, WI 53202-5308				
ART UNIT		PAPER NUMBER		
		2857		
DATE MAILED: 03/18/2004				

## Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 164 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 164 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date of the CPA determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) system (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office Patent Legal Administration at (703) 305-1383. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at (703) 305-8283.

<b>Notice of Allowability</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	09/910,371	SEEM, JOHN E.	
	Examiner	Art Unit	
	Jeffrey R. West	2857	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1.  This communication is responsive to the Amendment filed January 06, 2004.

2.  The allowed claim(s) is/are 1,3 and 5-19.

3.  The drawings filed on 20 July 2001 are accepted by the Examiner.

4.  Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)  All    b)  Some\*    c)  None    of the:

1.  Certified copies of the priority documents have been received.

2.  Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.

3.  Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

5.  A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

6.  CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.

(a)  including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached  
1)  hereto or 2)  to Paper No./Mail Date \_\_\_\_\_.

(b)  including changes required by the attached Examiner's Amendment / Comment or in the Office action of  
Paper No./Mail Date \_\_\_\_\_.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

7.  DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

#### Attachment(s)

1. <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)	5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)
2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	6. <input type="checkbox"/> Interview Summary (PTO-413), Paper No./Mail Date _____.
3. <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____.	7. <input type="checkbox"/> Examiner's Amendment/Comment
4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit of Biological Material	8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance
	9. <input type="checkbox"/> Other _____.

## DETAILED ACTION

### ***Allowable Subject Matter***

1. Claims 1, 3, and 5-19 are considered allowable over the cited prior art for the following reasons:

U.S. Patent No. 4,990,893 to Kiluk discloses a method in an alarm system, including recording of energy consumption, such as electricity, gas or water utility consumption (column 3, lines 4-10), by repeatedly measuring a level of use of a utility to produce a plurality of utility measurements (column 2, lines 48-51 and Figure 2). Kiluk then discloses comparing a current measurement to a corresponding reference value at the same point in time. It is then determined whether the current measurement varies compared to the value and, if so determined, the severity of an abnormality in utility consumption is identified (i.e. evaluation of system performance) (column 2, line 57 to column 3, line 3).

Carey et al., "Resistance and Test-Based Outlier Rejection: Effects on Gaussian One- and Two-Sample Inference" teaches a method for outlier detection through the use of the Generalized Extreme Studentized Deviate (GESD) statistical procedure (page 326, column 2). Carey also teaches the definition of the GESD procedure comprising determining how many standard deviations a given outlier is from an average of the samples using the equation  $R1 = \max |X_i - \bar{X}| / s$  where  $X_i$  is the amplitude of the  $i$ -th outlier,  $\bar{X}$  is the average (i.e. mean) value of a plurality of samples, and  $s$  is the standard deviation. Carey also teaches determining the critical values using a common student t-distribution equation and determining the

percentile using the equation  $p = 1 - [(\alpha / 2) / (n - l)]$  (page 329). Carey also teaches determining an outlier, removing each outlier, and repeating the determining and removing steps until all outliers have been identified and removed (i.e. iterative peeling) (page 321, column 1).

Although the invention of Kiluk teaches many of the features of the claimed invention, Kiluk teaches identifying a data point indicating abnormal usage by employing a threshold, and does not identify the data point as indicating abnormal usage by employing a statistical procedure. Although the invention of Carey teaches many of the features of the claimed invention, Carey teaches an “iterative peeling” method for removing outliers that compares each outlier to a data set that contains outliers, removes the current outlier under analysis, and repeats the process for each outlier, and does not compare each outlier to a robust value determined from a set of non-outliers.

Furthermore, none of the cited prior art teaches, or fairly suggests, in addition to the other claimed limitations for determine abnormal consumption of a utility by a system, employing a statistical procedure to identify a set of outliers, removing the set of outliers to define a set of non-outliers, and evaluating the system in response to the set of outliers and the set of non-outliers comprising determining a severity of abnormal utility usage for each outlier by calculating how far each outlier is from a robust estimate value for utility usage determined from the set of non-outliers.

2. The following references are also cited as being pertinent to the examination of

the application:

U.S. Patent Application Publication No. 2002/0124001 to Chaudhuri et al. teaches a sampling method for aggregation queries including obtaining a plurality of values, identifying outliers in the plurality of values to form an outlier set, aggregating the outlier values, sampling non-outlier values, aggregating the sampled values, and combining the aggregated outlier and sampled values. Chaudhuri, however, does not deal with determining the severity of abnormal utility usage and does not calculate how far each outlier is from a robust estimate value determined from the set of non-outliers.

Sematech, "The Engineers Statistics Internet (ESI) Handbook: Grubbs' Test for Outliers" teaches an outlier detection method but Sematech does not deal with determining the severity of abnormal utility usage and, similar to the invention of Carey, identifies one outlier at a time for removal and therefore teaches away from employing a statistical procedure to identify a set of outliers.

Rosner, "Percentage Points for a Generalized ESD Many-Outlier Procedure" teaches a generalized ESD many-outlier procedure for detecting from 1 to k outliers in a data set but Rosner does not deal with determining the severity of abnormal utility usage and, similar to the invention of Carey, identifies one outlier at a time for removal and therefore teaches away from employing a statistical procedure to identify a set of outliers.

U.S. Patent No. 6,643,629 to Ramaswamy et al. teaches a method for identifying outliers in large data sets for identifying abnormal usage patterns by partitioning data

into sets that contain outliers of interest, but Ramaswamy does not deal with determining the severity of abnormal utility usage, does not employ a statistical procedure to identify and remove a set of outliers to form a set of non-outliers, and does not calculate how far each outlier is from a robust estimate value determined from the set of non-outliers.

U.S. Patent Application Publication No. 2001/0004726 to Lambrecht teaches a method and system for enhancing the accuracy of measurements of a physical quantity by dividing data into an outlier set and a non-outlier set, but Lambrecht does not deal with determining the severity of abnormal utility usage, does not calculate how far each outlier is from a robust estimate value determined from the set of non-outliers, and, similar to the invention of Kiluk, identifies a set of outliers using a trend line as opposed to employing a statistical procedure.

3. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffrey R. West whose telephone number is (703)308-1309. The examiner can normally be reached on Monday through Friday, 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marc S. Hoff can be reached on (703)308-1677. The fax phone numbers for the organization where this application or proceeding is assigned are (703)308-7382 for regular communications and (703)308-7382 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

jrw  
March 7, 2004

  
MARC S. HOFF  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2850